

New background data for ^{129}I , ^{36}Cl and U/Th-series radionuclides in Canadian rivers.

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Assessment of the potential environmental impacts of nuclear fuel waste involves multiple lines of argument, one of which is an evaluation of the possible increments to background concentrations of certain radionuclides. This is especially relevant for radionuclides such as ^3H , ^{36}Cl and ^{129}I where there is continuous cosmogenic or geogenic production. However, for ^{36}Cl and ^{129}I and certain U/Th-series radionuclides, data are scarce because the analysis methods are complex and costly. A recent review of available data for Canada and internationally provided useful ranges of concentrations in freshwater and soils, but there were substantial gaps in the data representing Canada. The present study used accelerator mass spectroscopy (AMS) to measure ^{129}I in river waters from the North West Territories, Manitoba, Ontario and New Brunswick. These locations were selected to provide information on any trends from coastal to mid-continent, and from north to south. Data were also obtained by AMS for ^{36}Cl in some of these locations. Radiochemical methods were used for ^3H and the selected U/Th-series radionuclides, and stable element concentrations were also determined. The results will be discussed in the context of the previous data, the spatial relationships, and the contribution to assessment of nuclear fuel waste disposal.